

1970

OPERATING SUMMARY

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ONTARIO WATER RESOURCES COMMISSION

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ONTARIO WATER
RESOURCES COMMISSION

FRANKFORD

● water pollution
control plant

● water supply system

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ONTARIO WATER RESOURCES COMMISSION

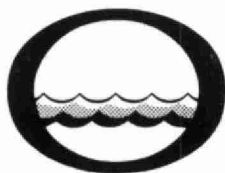
Division of Plant Operations

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Water management in Ontario

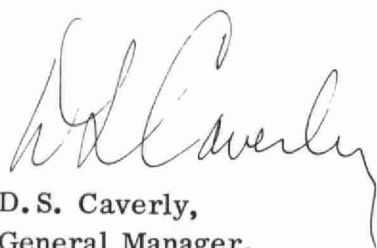
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control and water treatment facilities.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D. S. Caverly,
General Manager.



D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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FRANKFORD
water pollution control plant
and
water treatment plant

operated for

THE VILLAGE OF FRANKFORD

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY

DESIGN DATA

PROJECT NO. 2-0009-57

TREATMENT High Rate Trickling Filter

DESIGN FLOW 0.54 mgd (primary); 0.12 mgd (secondary)

SEWAGE PUMPING STATION

Pumps

1 electric, 0.54 mgd @ 20' tdh
1 gasoline standby 0.54 mgd @ 20' tdh

PRIMARY TREATMENT

Coarse bar screen @ 1" centres

Grit Removal

Type: Manually-cleaned channels
Size: Two 9' x 2' x 1' water depth
@ 0.54 mgd
Flow velocity: 0.5 ft/sec

Primary Sedimentation

Size: One 60' x 16' 6" x 7' 5"
(46,500 gal)
Retention: 2 hr @ 0.54 mgd
Loading: Surface, 565 gpd/ft²
Weir, 33,800 gpd/ft

SECONDARY TREATMENT

Type: Trickling filter
Size: One 42' dia x 4' depth

Recirculation: 3.1 through primary
Loading: 1.5 lb BOD/yd³/day

SECONDARY SEDIMENTATION AND CHLORINATION

Type: Earth-banked pond
Size: One 16' x 40' x 3'
Retention: 2 hr @ 0.12 mgd

PROJECT NO. 6-0002-57

SOURCE

One well

TREATMENT

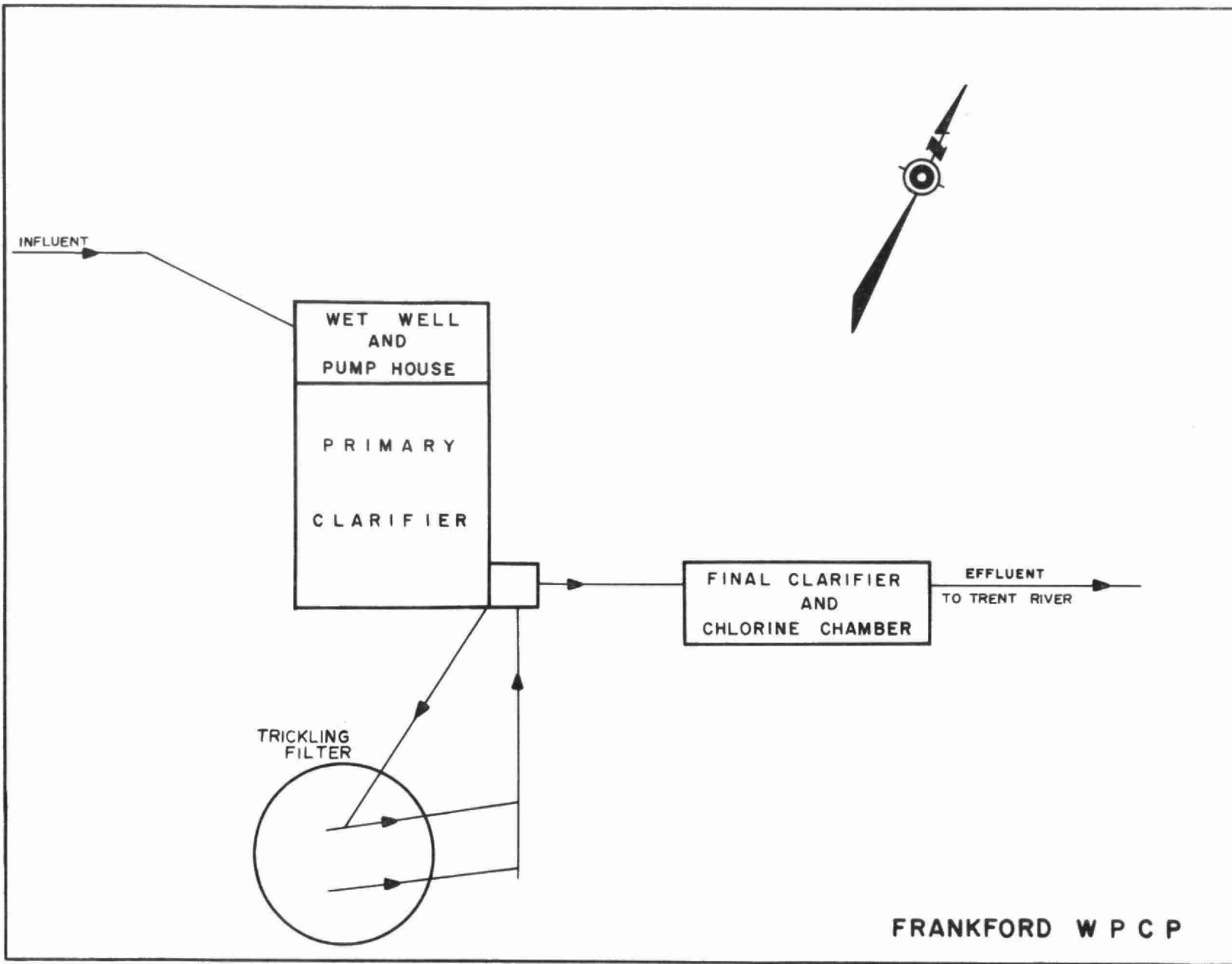
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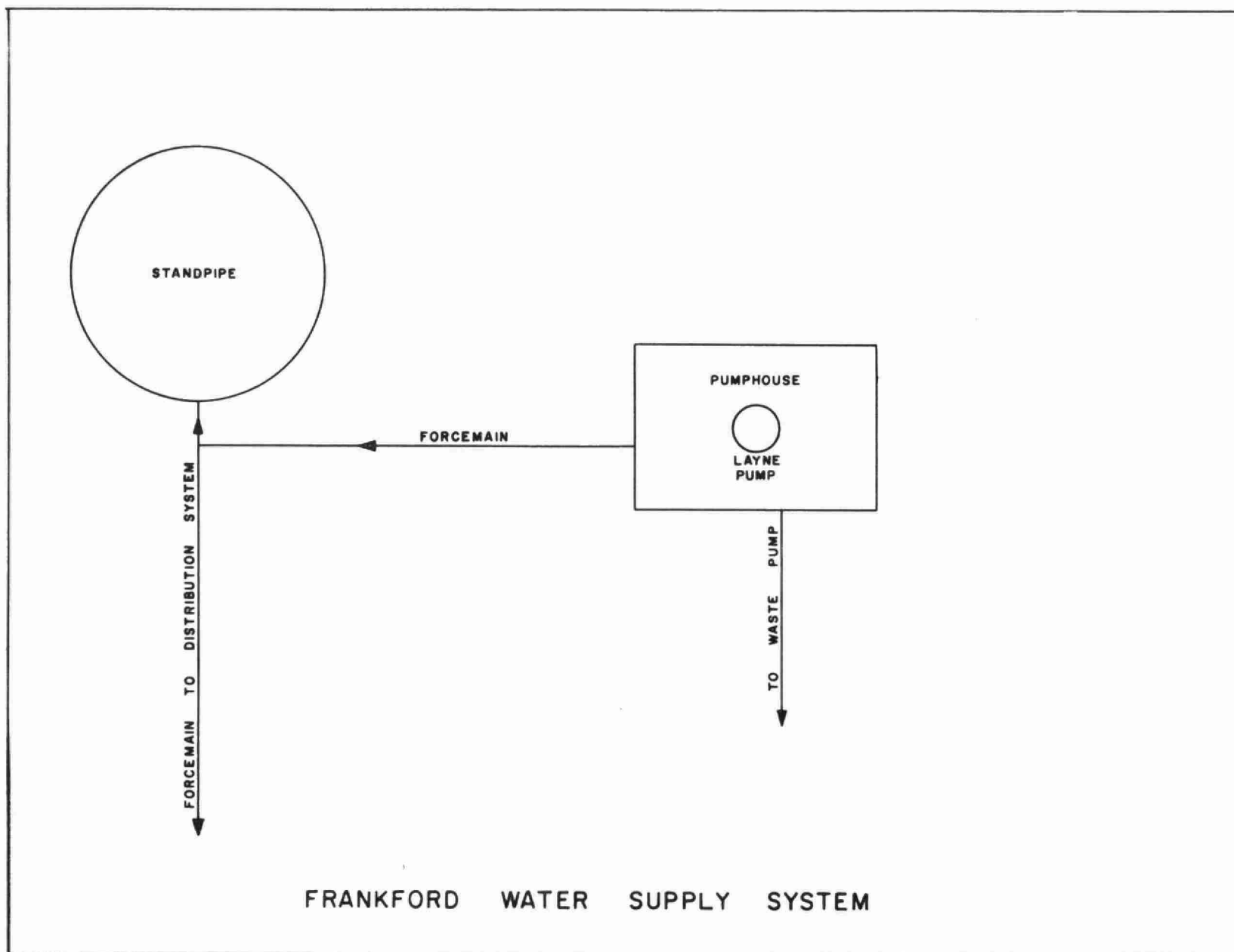
PUMPS

Type: Layne vertical turbine
Size: One 300 gpm (0.43 mgd)
Standby: none

STORAGE

One 115,000 gal steel standpipe





'70 REVIEW

GENERAL

This project encompasses a secondary sewage treatment plant consisting of a primary clarifier, a high rate trickling filter and a secondary sedimentation-chlorination pond, collector sewers and pumping stations.

The electrical control panel at the submersible pumping station was removed from inside the pumping station and relocated on an adjacent hydro pole. This was done to minimize electrical failures due to high levels in the wet well.

The Chief Operator was off work for seven weeks in 1970 because of illness. The sewage and water systems were operated by OWRC staff from Trenton during this period of time.

Approximately 500 feet of an old combined sewer was replaced on King Street. The total estimated cost of this new sewer was \$8,000 and \$4,000 of this total was taken from the OWRC Reserve for Contingency Fund with the balance being paid directly by the municipality.

Several basement floodings occurred during the year on Scott Street and King Street due to blockages in the sewer.

FLOWS and CHLORINATION

The actual flow of raw sewage to the plant cannot be calculated accurately for the greater part of the year because a portion of the trickling filter effluent is recirculated with the incoming raw sewage. A total of 2112 lbs. of chlorine was used to disinfect the plant effluent.

EXPENDITURES

The total operating cost for the sewage system for 1970 was \$9,116.67. This slight reduction in expenditures compared to 1969 was due to a good preventative maintenance program and a reduction in casual help.

PLANT EFFICIENCY

The average concentrations of BOD and suspended solids in the plant influent were 128 and 162 milligrams per litre respectively. The average concentrations of BOD and suspended solids in the effluent were 68 and 27 mg/l. The average percent reductions in BOD and suspended solids were 47 and 84 respectively.

SLUDGE DIGESTION

A total of 934.3 cubic yards of raw sludge was removed from the sewage treatment plant and disposed of at the municipal dump.

CONCLUSIONS

The percent reduction of BOD and suspended solids at the plant was acceptable for a trickling filter plant.

The design report for sewage plant enlargement has been completed and a financial analysis is being conducted in order to present a rate to the municipality.

WATER SYSTEM

This project consists of a deep well vertical turbine pump, a 115,000 Imperial gallon standpipe and a water distribution system.

FLOWS

A total flow of 37.76 million gallons was recorded at the water pumping station in 1970. This represents an increase of 12% over the 1969 flows. The average daily flow in 1970 was 0.103 million gallons.

EXPENDITURES

The total operating cost for the water system was \$3,137.64 in 1970.

CONCLUSIONS

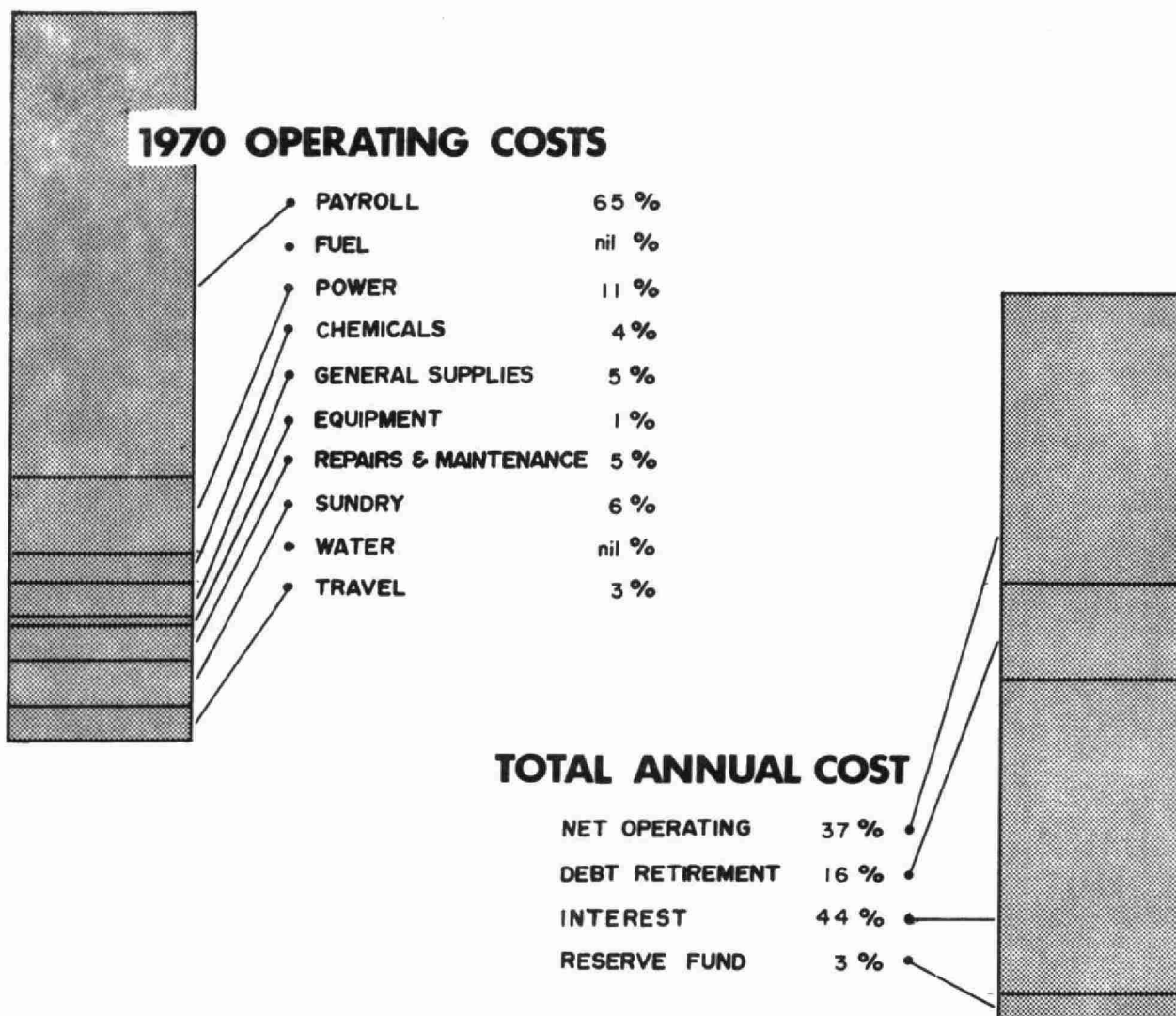
A design report covering the water works requirements for the Village of Frankford has been prepared by the consulting engineer and is presently being reviewed by the OWRC.

PROJECT COSTS

2-0009-57	
NET CAPITAL COST (Final)	\$162,062.20
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>4,899.45</u>
Long Term Debt to OWRC	<u>\$157,162.75</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	\$ <u>42,490.62</u>
Net Operating	\$ 7,449.52
Debt Retirement	3,172.00
Reserve	637.34
Interest Charged	<u>8,805.24</u>
TOTAL	\$ <u>20,064.10</u>

RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 8,424.09
Deposited by Municipality	637.34
Interest Earned	<u>427.37</u>
	\$ 9,488.80
Less Expenditures	<u>4,000.00</u>
Balance @ December 31, 1970	\$ <u>5,488.80</u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	56	\$5,615.77	\$100.00	
1967	60	6,027.80	100.00	
1968	64	6,802.96	100.00	
1969	50	9,195.85	183.92	
1970	-	9,116.67	-	

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	703.11	602.02	-	-	89.60	-	-	-	-	11.49	-	-
FEB	622.51	453.44	-	-	102.60	-	26.97	-	-	15.27	-	24.23
MAR	993.71	761.14	-	-	58.40	-	40.67	-	-	109.65	-	23.85
APR	959.42	676.53	-	-	56.45	-	34.11	50.96	97.51	14.76	-	29.10
MAY	395.54	93.33	-	-	97.40	-	79.62	-	87.08	10.96	-	27.15
JUNE	897.62	713.02	-	-	79.85	-	36.10	-	11.05	22.42	-	35.18
JULY	569.92	406.47	-	-	87.00	-	30.70	-	-	12.75	-	33.00
AUG	1087.00	850.81	-	-	68.15	-	47.48	-	-	85.54	-	35.02
SEPT	1254.16	632.16	-	-	56.45	-	41.84	-	292.73	202.18	-	28.80
OCT	693.04	442.95	-	-	36.95	174.35	-	-	-	13.74	-	25.05
NOV	862.52	665.01	-	-	109.20	-	25.88	-	-	29.51	-	32.92
DEC	78.12	(363.60)	-	-	138.60	174.35	52.19	-	-	56.41	-	20.17
TOTAL	9116.67	5933.28	-	-	980.65	348.70	415.56	50.96	488.37	584.68	-	314.47

BRACKETS INDICATE CREDIT

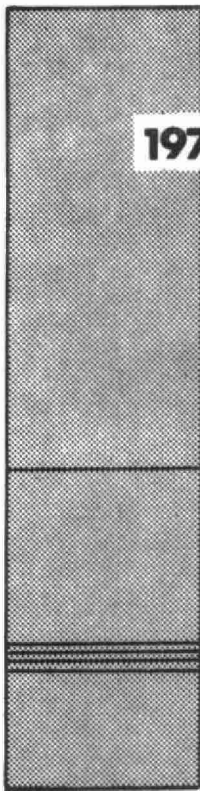
* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$75.00

PROJECT COSTS

6-0002-57	
NET CAPITAL COST (Final)	\$119,401.83
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>-</u>
Long Term Debt to OWRC	<u>\$119,401.83</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	<u>\$ 31,667.70</u>
Net Operating	\$ 5,204.80
Debt Retirement	2,410.00
Reserve	411.30
Interest Charged	<u>6,689.64</u>
TOTAL	<u>\$ 14,715.74</u>

RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 6,979.79
Deposited by Municipality	411.30
Interest Earned	<u>459.75</u>
	\$ 7,850.84
Less Expenditures	<u>-</u>
Balance @ December 31, 1970	<u>\$ 7,850.84</u>

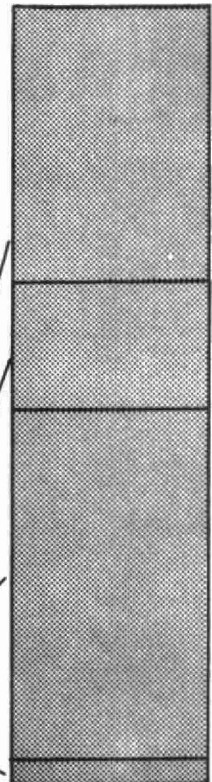


1970 OPERATING COSTS

• PAYROLL	59 %
• FUEL	nil %
• POWER	23 %
• CHEMICALS	1 %
• GENERAL SUPPLIES	1 %
• EQUIPMENT	nil %
• REPAIRS & MAINTENANCE	1 %
• SUNDRY	15 %
• TRAVEL	nil %

TOTAL ANNUAL COST

NET OPERATING	36 %
DEBT RETIREMENT	16 %
INTEREST	45 %
RESERVE FUND	3 %



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER THOUSAND GALLONS
1966	34.353	\$1,940.37	6 cents
1967	30.912	1,887.25	6 cents
1968	27.439	2,480.77	9 cents
1969	32.574	3,252.40	10 cents
1970	37.76	3,137.65	8 cents

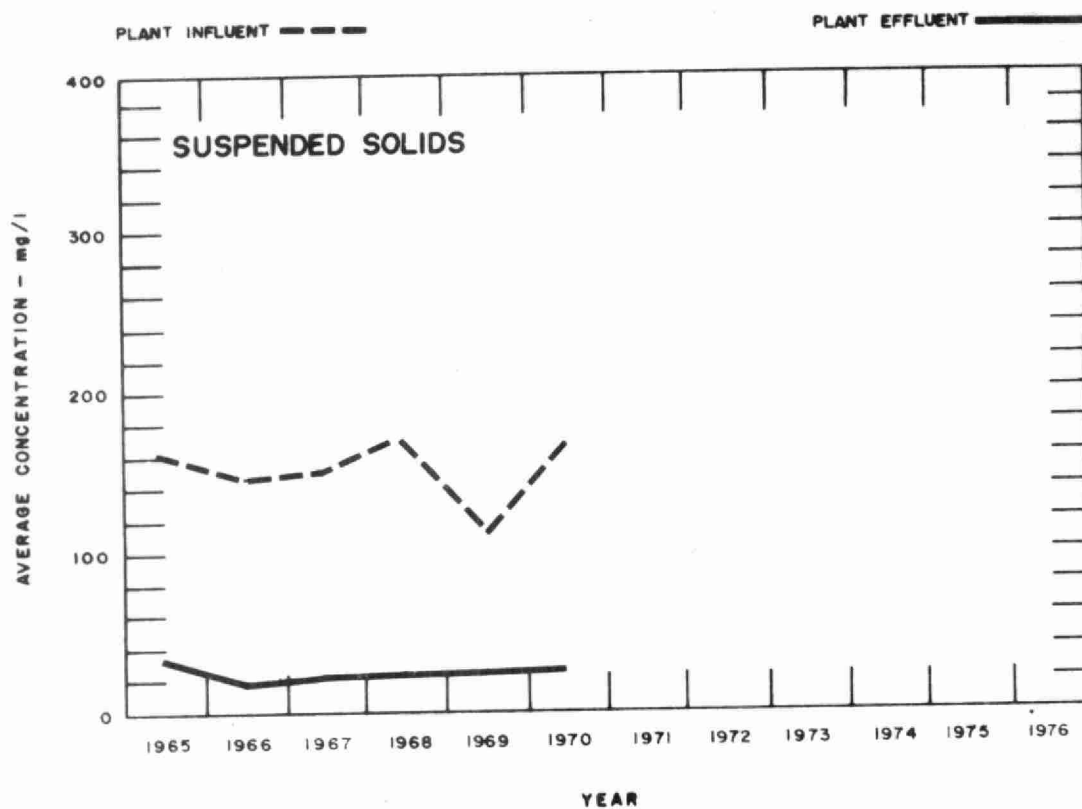
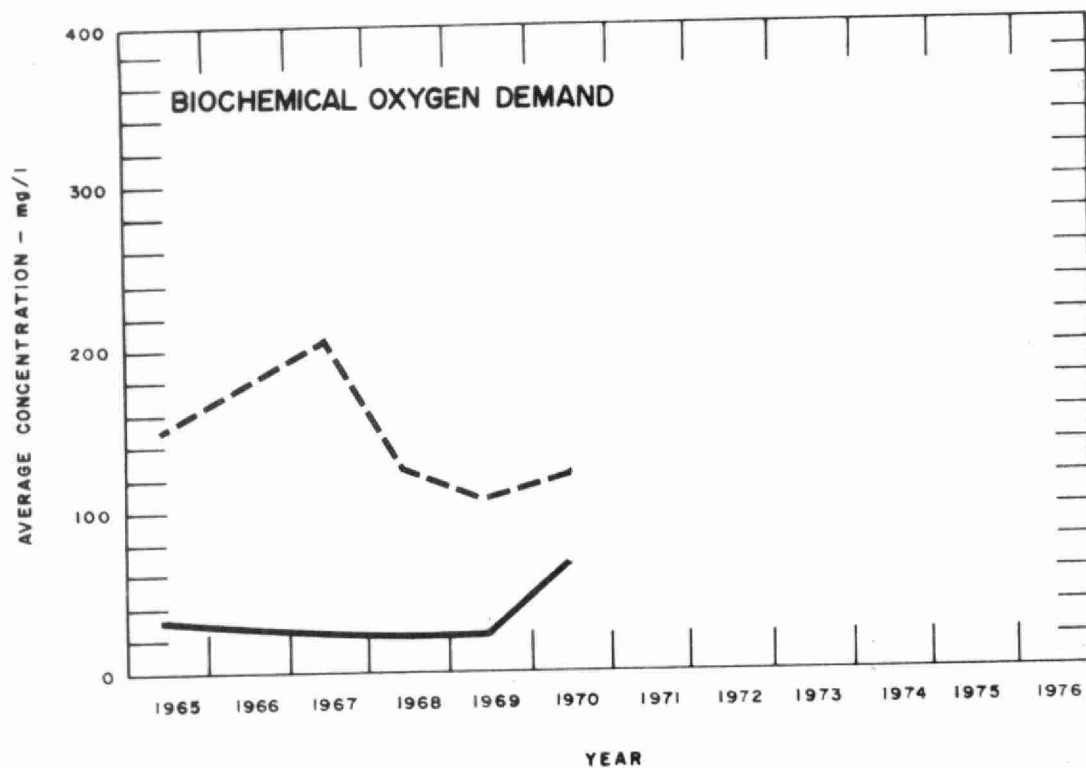
MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY	TRAVEL
JAN	311.50	197.85	-	-	113.65	-	-	-	-	-	-
FEB	215.61	139.61	-	-	76.00	-	-	-	-	-	-
MAR	257.10	-	-	-	52.60	-	-	-	-	204.50	-
APR	43.50	-	-	-	43.50	-	-	-	-	-	-
MAY	661.25	598.25	-	-	63.00	-	-	-	-	-	-
JUNE	42.45	-	-	-	35.05	-	-	-	-	7.40	-
JULY	246.53	172.35	-	-	35.70	-	-	-	38.48	-	-
AUG	61.05	-	-	-	61.05	-	-	-	-	-	-
SEPT	312.29	-	-	-	59.75	-	-	-	-	252.54	-
OCT	192.71	143.36	-	-	49.35	-	-	-	-	-	-
NOV	40.60	-	-	-	40.60	-	-	-	-	-	-
DEC	753.06	609.35	-	-	102.90	-	40.81	-	-	-	-
TOTAL	3137.65	1860.77	-	-	733.15	-	40.81	-	38.48	464.44	-

BRACKETS INDICATE CREDIT

Note: Total does not include year-end adjustments.

SEWAGE

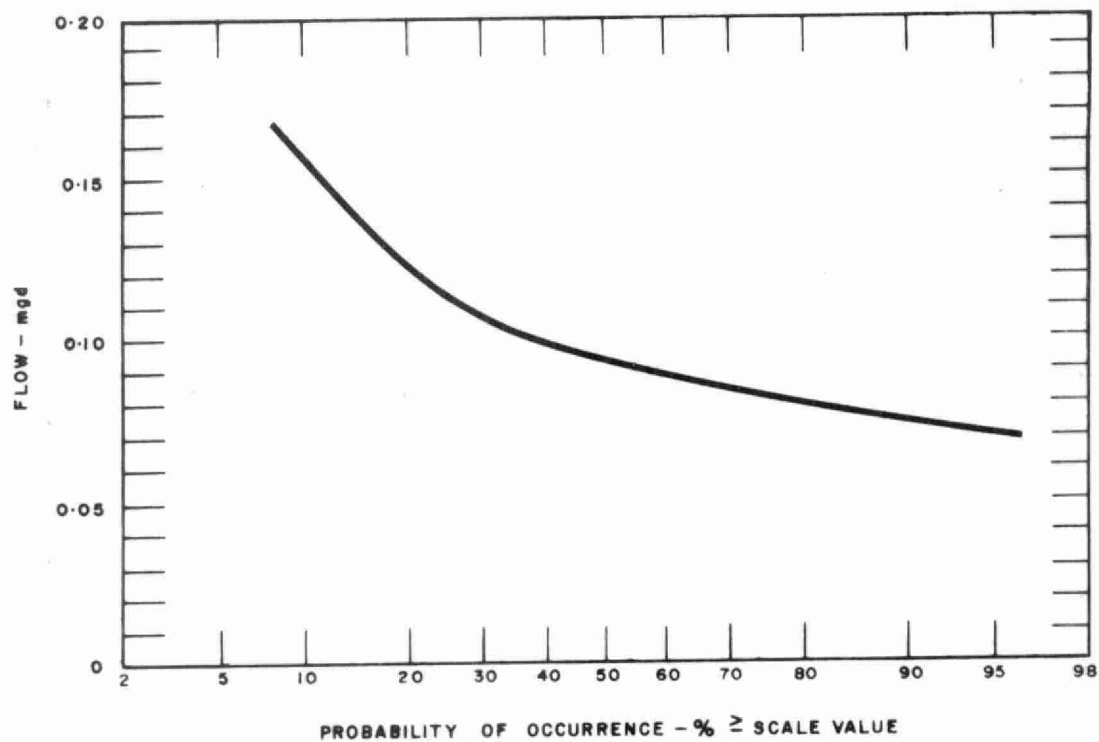


PROCESS DATA

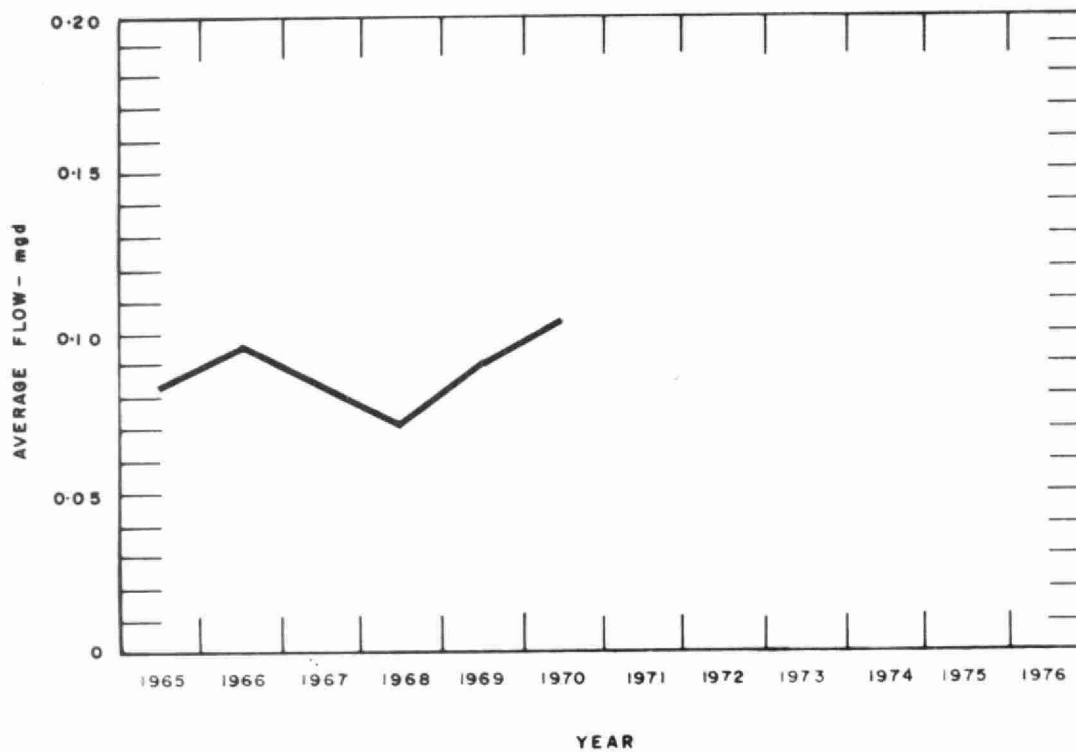
MONTH	B O D				SUSPENDED SOLIDS				GRIT REMOVED cu. ft.	CHLORINE USED pounds	SLUDGE HAULED cu. yd.
	INFLUENT		EFFLUENT		INFLUENT		EFFLUENT				
	n *	mg/l	n *	mg/l	n *	mg/l	n *	mg/l			
JANUARY	1	110	1	55	1	155	1	40	5	165	90.4
FEBRUARY	1	80	1	50	1	130	1	35	2	162	65.2
MARCH	1	100	1	48	1	160	1	30	2	199	68.7
APRIL	1	110	1	18	1	90	1	20	4	172	80.1
MAY	0	-	0	-	0	-	0	-	5	188	75.9
JUNE	1	160	1	34	1	235	1	30	4	168	87.9
JULY	0	-	0	-	0	-	0	-	5	185	83.2
AUGUST	1	82	1	40	1	85	1	28	6	185	90.1
SEPTEMBER	1	220	1	65	1	230	1	10	4	157	114.1
OCTOBER	1	160	1	220	1	220	1	25	4	167	129.7
NOVEMBER	0	-	0	-	0	-	0	-	3	179	49.0
DECEMBER	0	-	0	-	0	-	0	-	6	185	0
TOTAL	8	-	8	-	8	-	8	-	50	2112	934.3
AVERAGE	-	128	-	68	-	163	-	27	4	5.8 lb/day	

* n = number of samples

WATER



FLOWS



PROCESS DATA

MONTH	FLOWS			RAW WATER			PLANT EFFLUENT		DISTRIBUTION SYSTEM	
	TOTAL mil gal	AVG. DAY mgd	MAX. DAY mgd	No. of samples with COLIFORMS per 100 ml. of			No. of samples taken	No. with Coliform organisms	No. of samples taken	No. with Coliform organisms
				0	1 - 4	> 4				
JANUARY	2.73	.088	.120	2	-	-	-	-	2	0
FEBRUARY	2.65	.094	.162	4	-	-	-	-	4	0
MARCH	2.78	.090	.148	4	-	-	-	-	6	0
APRIL	2.64	.088	.110	3	-	-	-	-	9	0
MAY	2.80	.090	.118	1	-	-	-	-	6	0
JUNE	4.91	.142	.288	2	-	-	1	0	13	0
JULY	3.15	.102	.166	1	-	-	-	-	3	1
AUGUST	5.23	.160	.335	1	-	-	-	-	2	0
SEPTEMBER	2.70	.085	.114	-	1	-	1	0	6	0
OCTOBER	2.68	.086	.126	1	-	-	1	0	6	0
NOVEMBER	2.64	.087	.154	1	-	-	1	0	10	0
DECEMBER	2.85	.092	.116	-	-	-	-	-	-	-
TOTAL	37.76	-	-	-	-	-	4	0	67	1
AVERAGE	-	.103	.335	Geometric Mean 0 Coliforms/100ml			-	-	-	-

CHEMICAL CHARACTERISTICS

PROPERTY	RAW WATER				PLANT EFFLUENT				DESIRABLE STANDARDS
	Number of Samples	Average	Maximum	Minimum	Number of Samples	Average	Maximum	Minimum	
HARDNESS mg/l as CaCO_3	3	285	298	264	-	-	-	-	80 - 100
ALKALINITY mg/l as CaCO_3	3	233	246	222	-	-	-	-	30 - 100
IRON mg/l Fe	3	0.05	.05	.05	-	-	-	-	< 0.3
CHLORIDE mg/l Cl^-	3	15	15	14	-	-	-	-	< 250
pH Units	3	7.6	7.8	7.4	-	-	-	-	

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Water management in Ontario